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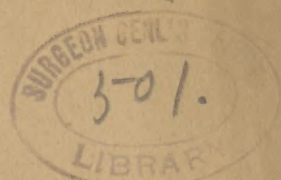
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THE RELATIONS BETWEEN SANITARY SCIENCE AND
THE MEDICAL PROFESSION.

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SANITARY SCIENCE.



What is sanitary science? This phrase is comparatively new, but is full of meaning. The word "sanitary," in its derivation and uses, signifies health or healthy, but when combined with science, is far more expressive. It means the application of laws or principles for the preservation of health in whatever way they may be employed. As to the use of the term science here, the claim cannot justly be called in question. To such an extent have these principles been discovered and applied, and so uniformly and certainly have the same results followed, that they may be said to constitute a science—the *science of health*.

It is not necessary that these laws should be understood by everybody, and admitted as true, that they be considered a science; but if they have been extensively applied by a large number of good judges, and the same results never fail, they constitute, when combined, to all intents and purposes, a *science*,—as much so as physiology or biology. Both these are comparatively modern sciences: so is that of sanitation, certainly in name and application.

It is only about forty years since this subject began to attract general attention. It started with the establishment of the registration of births, deaths, and marriages in Great Britain, by Dr. William Farr. While investigating upon a large scale the causes of death, the inquiry naturally arose, What can be done to prevent as well as to cure disease? This inquiry, from a small beginning, has resulted in the most surprising advance in a knowledge of the laws of health and life. So rapid and extensive have been these changes, that one living during this period can hardly credit them; and never were these improvements taking place faster than at the present day. But the advantages already secured, though great and invaluable, are mere harbingers of richer and more permanent blessings in store. In the progress of this science, every year has signalized the fact that it had a deeper and broader scope; that its aim is not merely to remove the existing causes of diseases, but to destroy the germs or seeds of disease. It has also, we believe, a still higher and more important aim,—that is, to improve and perfect human organiza-

tion. It does not stop with preventing this or that contagious disease, or reduce to the minimum the zymotic class of diseases; but when the principles of this science are applied to the fullest extent, they will present the human body so sound and healthy in all its parts as in a great measure to forestall disease.

There is, we believe, a normal standard of physiology, where all the organs are so sound and well balanced, and where all perform respectively their functions so thoroughly, as to afford small chances for disease. This organization represents the highest standard of health; and the nearer the human body in all its parts approximates to this standard, the better or higher degree of health will every such person possess. With this view of physiology, it will be seen that all disease is a violation of law, whether it arises from internal or external causes. As there must be some change in the structure or functions of certain organs in the body for the introduction of disease, is it not clearly the province of sanitary science to take cognizance of such changes? If the violations of law can be arrested or modified in the very first stages, may it not serve to prevent a vast amount of disease?

There is a sphere higher and broader, where the principles of this science should be brought to bear,—that is, in perfecting the human body. It is well known that there is naturally a most surprising difference between one individual or one family, and another, as to good health and the liabilities to disease. Why should not sanitary science recognize this difference more, and point out the way whereby great improvements can be made in the physical system, and then eradicate, upon a large scale, the first, the primary, causes of disease? By commencing early, and with the use of proper means, the organization of every individual can be greatly improved and made more healthy; and by a proper application of the laws of inheritance for three or four generations, human organization may become so perfected as to diminish a large proportion of the sickness and disease that exist at the present day. This is not mere theory nor speculation, but a doctrine based upon the laws of physiology—laws which should be better understood. Inasmuch as such a change would be productive of sanitation in the highest degree, is it not the province of sanitary science to enter and cultivate this field? Would it not improve health and prolong life upon the largest scale and to the greatest number? What other science or agency can do this work so well? That human organization can be improved by the laws of exercise, nutrition, and inheritance there can be no question. If the highest state of health depends on a normal standard of physiology, in which all parts of the body are perfect in structure, combined with a harmonious development of every organ, it is certainly the province of sanitary science to use all its appliances to obtain that standard. It is no more nor less than the same form or image in which man was created; and the same Almighty power has established laws by the use of which man, in the process of time, can attain to that of his original creation. The more thoroughly physiology is studied with reference to sanitation,

the stronger is the evidence that man is the artificer of his own physical well-being. The laws of inheritance must become the agents of sanitary science; and healthy offspring must become an object of primary importance. When the principles of physiology and sanitary science are both brought to bear in renovating human organization, we shall find that a wise provision is made for the redemption of the body as well as the soul. We cannot expect this change will be brought about by divine interference, nor is it left for accident or chance, but the means and responsibility are wisely placed in the hands and power of human agency.

In case the body is thus reconstructed,—made sound and healthy in every part,—the germs or seeds of disease will not be found in the system. Here is work for sanitary science on the largest possible scale. In making these changes, in order to secure the highest standard of health and to the greatest number, it will be seen that sanitary science has a great work to do. The whole system of education, especially in early life, must be based more and more upon the systematic training and development of the body. There are a multitude of evils in the present state of society that conflict with the laws of health and life, which sanitary science would tend to remove or regulate. Then, in all matters pertaining to mental improvement, to the progress of society, to every phase in civilization and the various developments of Christianity, the sanitation of the body and of the mind should be paramount to everything else. In fact, the province of sanitary science covers the entire life, not only of every individual, but of the whole human family. No other subject or science is of such transcendent importance. It is in its infancy, and no comparison can be made between what it now is and the magnificent proportions it is destined to attain.

Taking this view of physiology, and that health is its normal condition, it will be seen that all deviations from this state, or violations of the laws that govern it, furnish the causes or entrance of weaknesses, imperfections, and diseases which afflict the human system. These changes may occur from internal, predisposing causes, or from agents operating externally to the body. Just at this point, in these changes of organization from a normal to an abnormal state, we are taught most important lessons. On one side, we have sanitation and sanitary science; on the other, disease, and its superstructure, medicine. Just here start the most powerful and destructive evils that ever befell the human family. These evils may be trifling in their origin, but increase—sometimes slowly, sometimes rapidly—and become terrible in their results. They include the whole catalogue of diseases; their name is legion. We dwell on this point, for it is very important to have clear and definite ideas of disease, its nature and cause. It is simply the penalty of violated law. There is no mystery in it; no visitation of Divine Providence; no curse inflicted by some evil spirit. It is no less important for sanitarians than for physicians to have a clear and definite knowledge of disease as well as its cause.

HISTORY OF SANITARY SCIENCE AS CONNECTED WITH THE MEDICAL PROFESSION.

Formerly the great object of the medical profession was the *cure* of disease. The programme of studies and lectures in the medical schools was confined almost exclusively to this one idea. The term "hygiene" was scarcely to be found in books, or referred to in lectures. Physiology was comparatively a new science, and some of its most important applications have not been discovered, till within a few years. In fact, this science can not be fully understood in all its bearings without combining with it the principles of hygiene.

The study of physiology was formerly superficial, rather than profound. As the laws of health and life are based on this science, these of course were not very well understood. Hence there was great difficulty in ascertaining the real causes of disease, and the natural laws that governed it. *Health and its normal conditions* must be first understood, and disease—its causes and treatment—come afterward. Very little thought or attention was given to the object paramount to all others—health and its requirements. The whole burden of medical studies and lectures was pursued with special reference to disease and its treatment. Thus, in the preparation for the practice of medicine, the treatment of disease had so completely absorbed attention that normal physiology and the recuperating powers of nature have, in a measure, been overlooked. "*Vis medicatrix*" was a favorite phrase of some writers, but very little use has been made of its practical application.

Two great evils have grown out of this defective mode of education: 1st, a lack of clear and definite ideas of diseases and their causes; and 2d, a tendency, in the treatment of disease, to resort mainly to artificial means. But within thirty or forty years there has been decided improvement in respect to both these evils.

About 1840 several leading physicians in Great Britain, from careful observation and reflection, began to make some changes in their practice: 1st, to dispense less medicine; 2d, to study more carefully into the natural laws of disease; and 3d, to summon to their aid the powerful resources of nature. Among these physicians were John Forbes, John Connolly, Andrew Combe, and others. The *British and Foreign Medical Review* was their organ of publication, which attracted much attention. Several works explaining the views of these men were published at that time, and had a large circulation.

From 1840 to 1850 the registrar-general's office, for collecting and publishing reports of the births, marriages, and deaths in Great Britain, became fairly established. This agency has been more influential than any other for creating an interest in sanitary matters. An examination into the causes of death in different localities, and comparing the mortality of one place with another, started many inquiries on public health. The annual reports also from this office, prepared by Dr. William Farr, added greatly to the interest on this subject. About the same

period Dr. Andrew Combe, of Edinburgh, published several works on the application of physiology to education and health. These works had a very large circulation, and exerted great influence in directing public attention to the laws of health and life. The writings of Dr. A. Combe were peculiarly calculated to show the advantages of a practical knowledge of physiology for developing healthy bodies, and thereby preventing disease. While the writings of Dr. Combe were based strictly on scientific principles, they were remarkably well adapted, both in style and matter, to instruct the masses.

One of the most distinguished physicians at this time in Great Britain advocating reform in medical practice was Dr. John Forbes. In his celebrated paper called "Young Physic," which was published in the *British and Foreign Medical Review*, he made this significant statement: "Redoubled attention should be directed to hygiene, public and private, with a view of preventing diseases on a large scale, and individually in our sphere of practice. Here the surest and most glorious triumphs of medical practice are to be achieved." If this prophecy has not already been fulfilled, it is very evident that, in process of time, it will be, still more abundantly.

As a result of the interest on this subject, a royal commission was appointed, in 1857, to inquire into the sanitary condition of the army in England. This commission recommended that not only some regulations should be adopted for protecting the health of the army, but that a school be established for educating army surgeons, in which "hygiene and sanitary science" should be taught. This was the nucleus or starting-point of that celebrated work on practical hygiene by Dr. Edmund A. Parks. This "Manual of Practical Hygiene," constituting a treasury of knowledge on sanitation, has had a large circulation, and passed through several editions.

The interest in sanitary matters has been steadily increasing in Great Britain among all classes. Its fruits are becoming every year more and more manifest by improved health generally, and by a reduction of mortality, especially in cities. Numerous acts of parliament have been passed in favor of sanitary science. The medical profession and journals generally commend it; and never were its prospects brighter in Great Britain than at the present time.

Perhaps the science has not created so general interest nor taken so strong a hold in the United States as it has in Great Britain; but still its history is one of marked interest. Let us notice a few of its salient points. From 1830 to 1840 Dr. John Bell conducted the *Journal of Health* in Philadelphia, which very ably advocated the principles of hygiene. In 1835 Dr. Jacob Bigelow, in the annual address before the Massachusetts Medical Society, pronounced a certain class of diseases "self-limited" in their character, and urged that they should be treated accordingly. This was a marked step in the way of medical reform, which, with other influences, led to what was called the "expectant treatment of disease."

In 1842 was issued the first registration report of births, marriages, and deaths in Massachusetts, and has been continued annually till we have now the forty-fourth report. Sanitary science has been greatly advanced by facts and arguments derived from these reports. Several other states have followed the course of Massachusetts, in establishing registration departments. No one agency can do so much to advance the cause of vital statistics as such registration reports. The application and progress of sanitary science depend much upon a knowledge of vital statistics; and the more thoroughly these are understood, the better for the cause of sanitation.

In 1844 Dr. Elisha Bartlett published in Philadelphia a work on the "Philosophy of Medical Science," and, in urging upon the profession a better knowledge of the cause and nature of disease, said,—“The next thing to be done is to find out the best methods of modifying and *preventing* disease. This is the great mission which now lies immediately before us: *this is to constitute the great work of the next and succeeding generations.*” This statement was made two years before that of Dr. Forbes, already quoted. Both these men, living in advance of the times, were distinguished for original thought and independence of expression; they have proved themselves true prophets.

In 1845 Dr. John N. Griscom, of New York, made an urgent appeal to the mayor and city government in behalf of the “sanitary condition of the laboring population of the city.”

In 1847 the American Medical Association was formed, and provided for a section on “Public Hygiene.” Many excellent papers on this subject will be found in the Transactions of this association.

In 1850, under the direction of the legislature of Massachusetts, an elaborate report on the “Sanitary Survey of the State” was issued by a board of commissioners, of which Lemuel Shattuck, Esq., was chairman.

In 1860 a very important “Sanitary Convention” was held in Boston in the interests of quarantine. As this agency has been mainly confined to the prevention of the extremely contagious diseases, the general interests of sanitation have not formerly come into account. But at the convention referred to, a committee was appointed, of which Dr. A. N. Bell was chairman, which made an exhaustive report, containing hints and suggestions of great value. Dr. Bell is now the editor of that popular magazine, *The Sanitarian*, published in New York, which has done excellent service for sanitary science.

In 1860 one of the most brilliant addresses ever given in this country was delivered before the Massachusetts Medical Society by Dr. Oliver Wendell Holmes. As this had a direct tendency to promote sanitary science, the address and its reception deserve special notice. At this time the importance of a more thorough study of *Nature* in medical practice had been urged on the profession in previous addresses and other medical papers published. In pursuing this line of thought, Dr. Holmes expressed very positive opinions, accompanied with reasons and

illustrations, that too much medicine altogether was given by the profession, and that there were great evils arising from over-medication. For this opinion Dr. Holmes was not only severely criticised by prominent physicians, but denounced and abused, if harsh language could do it. But reaction soon followed this violent attack. The discussion led many physicians to a new and more careful study of the natural laws of disease and the true effects of drugs. Great good came out of this controversy. Dr. Holmes, instead of being injured, gathered new laurels. Many young physicians, seeing the propriety and force of his strictures, struck out a new course in their practice.

The most efficient agents of all for establishing and applying the principles of sanitary science are boards of health. The first state board of health in this country was formed in Massachusetts in 1869, since which time boards have been started in nearly all the states of the Union. In 1872 the American Public Health Association was organized in New York. This is the most extensive and powerful agency of the kind in this country, and we think we may safely say in the world. It has published eleven large volumes, which contain a greater and more valuable collection of papers on sanitation than can anywhere else be found. The primary object of the Association, as stated in its constitution, is the "advancement of sanitary science." A careful examination of the contents of these volumes affords the strongest possible evidence that the Association has done a grand work. Here almost every question connected with the science, in all its diversified applications, is found discussed. Some of the papers show great research and an originality of thought which might be elaborated into a volume. Besides its published works, the Association has greatly advanced the interests of sanitary science in all the cities where it has held its annual meetings.

RELATIONS OF SANITARY SCIENCE TO THE PROFESSION.

While the success of this science depends mainly upon physicians, there is a wide difference in the interest which they take in it, as well as in the sacrifices which they are willing to make for it. Let us inquire who, and how many, of our physicians have been actively engaged in this reformatory work. The number, compared with the whole profession, is not large,—in fact, is very small. Those engaged in this work are widely scattered, both in city and in country, and are generally active with the pen and tongue, so that they seem more numerous than they really are. There are, it is true, great numbers in the medical profession who are kindly disposed to sanitary reform, and speak highly of it in their practice, but at the same time are unwilling to make much sacrifice to advance its interests.

Unlike many other reforms and good works, there is a direct antagonism between the interests of this profession and sanitation. The support of this profession depends mainly on the *cure of disease*, not its prevention. Every step in this reform diminishes more or less profes-

sional income. There is no trade or speculation in this reform. When a person has spent years in study, and made large investments to secure a livelihood, how can we expect he will sacrifice these interests? There is probably no class of men engaged in professional or other kinds of business to whom appeals of so complex and antagonistic a character are made for services. The result depends much upon the education and the moral training of parties. On the one side stands out the highest welfare of the individual and society in respect to health, while on the other side the physician is tempted to make his own interests paramount to all others.

Let us for a moment consider his position. In choosing this profession the pecuniary considerations were undoubtedly most powerful; and, then, in his early preparations and through his whole course of study compensation for professional services has been constantly kept in mind. The whole drift of medical study and teaching, by sickness or from books, has express reference to the treatment and cure of disease,—not, as we may say, its prevention. Add to this the most implicit faith that all classes generally have in drugs, together with the crowded state of the profession, it will be seen that the physician is virtually constrained to have an eye constantly on his business. It is true that in medical studies, in lectures, and in books a great deal is said about the charitable aspects of the profession, and that it is always expected to give a large amount of service to the poor.

It is just to state here that the claims of the sick poor have been most liberally responded to by physicians, and that no other profession or class of men do so much for the poor as the medical profession. But this work of charity has its equivalents: it secures to the physician a stronger hold in the affection and confidence of the people, and, in different ways, tends to increase his business. But to engage actively in means to prevent disease, not simply in one instance, but in case of great numbers, this is very different: it cuts off directly the support of the physician. Such action is based upon a love of humanity, of philanthropy,—a higher range of motives than that of giving services to the sick poor. It appeals to the very highest class of motives, not simply to save expense and relieve suffering, or improve health and prolong life, but to elevate mankind, and increase physically, mentally, and morally the sum of human happiness. Such are the legitimate fruits of sanitary science.

Considering the powerful pecuniary interests of the profession, and the disinterested motives requisite to engage in sanitation work, it is rather surprising that so many members of the profession have from time to time engaged heartily in advancing sanitary science. The main object must have been the promotion of health, the diffusion of useful knowledge, and the enlightenment of mankind generally in respect to the laws of health and life. In some few instances it might have been prompted by pecuniary considerations,—the individual holding some official position, or seeking one. But these are exceptional cases. Our state and

municipal authorities have made such small appropriations for public health that the salaries offered to medical men are not numerous or large enough to be very attractive. In this respect Great Britain is far ahead of us. The promotion of the public health has become there a part of her government machinery. The whole kingdom is divided into some fifteen hundred districts, over each of which a medical officer of health is appointed, with salary graded according to the services rendered.

Besides this provision, and showing the interest of the government in sanitary matters, there are over one thousand inspectors of nuisances appointed, in charge of as many districts. This inspection proves of great advantage, not only directly in preventing disease, but by dispensing information among the people they become helpers in the work. The medical appointments in Great Britain are made on the ground of special training and qualifications for this kind of work, and the same persons are continued in office for years. Thus there is a wide difference between the interest in sanitary science in Great Britain and in the United States. In the former the science receives a powerful support from the government, and a large amount of means is annually distributed among its advocates. Besides, there is on the part of the people more general intelligence on the subject, a higher appreciation of the benefits of the science, and a more ready disposition to coöperate in carrying on this reform. Though the science has been making advances in these respects in the United States, there is much room for improvement. Our national government is not doing what it ought for public health; neither are the state or municipal authorities making the appropriations for it which they should.

Most of the contributions to sanitary science here have been voluntary. This reform has been carried forward by men heartily interested in the work; very few seeking or expecting any remuneration. The reward for such services does not consist in dollars and cents, nor in the plaudits of the multitude, but in "the consciousness of duty done and noble deeds performed." A distinguished medical writer lately made this remark: "The most important work that sanitarians are doing at the present day is 'sowing seed which in time will yield abundant harvest.'"

And never in the history of medicine was there such a combination of circumstances so favorable to improvement in the practice of medicine. Never before has there been such earnest inquiry on the part of the profession to ascertain the true causes of disease. It has been found in the moral world that in order to eradicate great evils their primary causes must first be removed. So in the prevention of disease, the same course must be pursued. This accords with the teachings of sanitary science. Leading members of the medical profession have here been doing noble work.

SANITARY IMPROVEMENTS IN MEDICINE.

Some twenty-five years ago Sir Joseph Lister, of Edinburgh, made a great discovery for the prevention of disease by introducing what has

been called "Antiseptic Surgery." It had been found prior to that time that wounds and surgical operations were frequently followed by an inflammation which proved fatal. Surgeon Lister discovered that by an application of antiseptic dressings, patients were more sure to recover from the most dangerous operations. It is, moreover, found that antiseptics can be applied to many diseases, as well as to surgical cases, which check their progress and aid essentially in the recovery. It is now admitted that a great amount of disease is thus prevented and a multitude of lives saved.

Again: In this same line of prevention, there has been made within a few years one of the greatest discoveries ever made in the history of medicine—that some of the most dangerous diseases are produced by infinitely small animalculæ called bacteria, and other micro-organisms. This subject is now undergoing most thorough investigations in Germany, France, and Great Britain. If means can be devised whereby these bacteria can be destroyed, or their existence eradicated from the system, it will prevent a vast amount of disease.

Again: There seems to be a prevailing impression in the medical profession that important changes are about to take place in the treatment of diseases. This sentiment is foreshadowed in a variety of ways, and many facts and illustrations might be cited in proof of the same. The most noticeable instance is the following: Dr. Austin Flint, of New York, was invited last year by the British Medical Association to give an address this year before that body. Dr. Flint died suddenly in March, but his address, by singular forethought, was found prepared for this occasion, which has since been published. The very title of the paper is significant,—*"Medicine of the Future."*

No physician in the United States could discuss this subject with greater propriety and force than Dr. Flint, and, inasmuch as he was to voice the medical profession in this country before the highest medical body in Great Britain, it shows the importance he attached to this topic in its selection. At the same time, in presenting these views, he must have been pretty well assured that they would be cordially received by the leading members of that association. After recounting in the forepart of this address the changes that had taken place in his own experience in medical practice, he says,—*"We are entering upon a revolution in medicine. It is bewildering to project the thoughts into the future in order to foresee the changes which will be brought about in the coming half-century in our knowledge of the correction of diseases, and the results as regards their prevention and treatment."*

He expresses the opinion that hygienic agencies will be employed hereafter far more than they have been; that the normal conditions of health and the recuperative powers of nature will receive greater attention, and less dependence will be placed upon drugs and other artificial means. In referring to bacterial etiology, he says,—*"Here open to the imagination the future triumphs of preventive medicine in respect to all classes of diseases."* When the medical profession, says he, "shall

employ all the preventive measures possible, and the best remedial medicines, disease will be more successfully treated, and the profession will have reached a high ideal position."

Alongside of this testimony we will quote the opinions of three distinguished English physicians, who have given special attention for many years to sanitary science.

Says Dr. B. W. Richardson.—"The influence which sanitation will exert in the future over the science and art of medicine promises to be momentous. It promises nothing less than the development of a new era: nor is it at all wide of the mark to say that such new era has fairly commenced. With the progress of sanitary science we must expect to see preventive medicine taking the ascendancy. With true nobleness of purpose, true medicine has been the first to strip herself of all mere pretences to cure, and has stood boldly forward to declare as a higher philosophy the prevention of disease. The doctrine of absolute faith in the principle of prevention indicates the existence of a high order of thought, of broad views on life and health, on diseases and their external origin, on death and its correct place in nature."

Says Dr. Alfred Carpenter.—"The science of disease-prevention is destined to alter the whole field of medical practice: to render obsolete much of our present knowledge as to the history of diseases and the measures which are now required for their treatment. The inquiry must come as to how the increase of disease is to be prevented, rather than, having arisen, how it is to be cured. This will apply to every kind of complaint, and will not be limited to any one class."

Says Sir Henry Acland.—"In addition to treatment and cure of disease, whatever be the duty of individuals, medical science and art collectively must aim as a whole, 1st. At the preservation of health; 2d. At the averting of disease from individuals and the public generally; 3d. At rearing healthy progeny for the family and the state by probing the laws of inheritance; and, 4th. At procuring legislation effectual to these ends. It claims, therefore, a voice in moral education as well as physical training. It holds a duty in relation to the diminution of vice, for the sake not only of self-destroying victims, but more for the sake of the innocents whom they ignorantly slay."

It would seem that in the opinion of Dr. Acland sanitary science covers very important ground. This opinion may be accounted for in part from the fact that he has long been a professor at the Oxford University, has had large experience in educational matters, and understands the full import of physiological laws. If the preservation of health or the prevention of disease is accomplished by improving the organization, a multitude of other improvements follow: and the more perfect the former, the greater will be the latter.

There is one method of preventing disease, referred to by Dr. Acland and other writers, which has never received the attention it deserves, that is, by the observance of the laws of inheritance. Within a few years this subject has been considerably discussed in the United States

and Great Britain, but few seem to appreciate fully the magnitude of its bearings on sanitation. The diseases considered preventable—of which there are nine or ten—come under the zymotic class, but there are two other classes, called constitutional and local, each larger than the zymotic. Thus far sanitary science has expended its principal force upon this class; but supposing its agencies could be brought to bear equally upon the prevention of diseases in these two classes, what a vast amount of good it would accomplish! Let us explain. For many years there has been a class of diseases called “hereditary,” because the predisposing causes were inherited, because these are transmitted from generation to generation, and thus run in families. Now, if those ancestors were free from any taint, or, in other words, had perfectly sound and healthy constitutions, the seeds, the germs, the predisposing tendencies of disease, would not be transmitted. Let us carry out a little farther this line of argument.

The same kind of evidence which proves that the germs of, or predisposition to, disease are transmitted in a single instance, applies to all others of a similar character; and the legitimate inference is that there must exist in nature a great general law. Such a law, we believe, exists, and is based upon a normal standard of physiology,—a standard for the government of the human body, wherein all its parts are perfect in structure, and its organs harmonious in their functions. This standard of organization constitutes the highest measure of health: is free from all kinds of weakness, as well as predisposition to disease. But, unfortunately, we do not find such organized standards in the present state of society—only approximations; and the nearer individuals or families approach this standard, the sounder the constitution, the less disease; whereas, the further the deviations diverge from this standard, the greater are the weaknesses and liabilities to disease. Here come in the laws of inheritance,—starting not in a perfect, healthy organization, but in conditions of the body where changes of some kind have taken place in the vital forces of the system. To understand and utilize these laws, they must be reduced to some system; the distinct relations between the causes and the effects must be traced out, till we find a great general law serving as a standard of appeal, or as a regulator to all the minor ones.

There can be no question but that in the inheritance of *morbid tendencies* we have one of the most fruitful sources of disease. This will become more patent in proportion as the principles of physiology shall become better understood in their connection with hereditary influences. Without attempting to describe the various ways in which the seeds of disease, or the predisposing causes, are transmitted from parent to child, we may say they are *manifold*,—in organization or function; in defective or abnormal structure; in the weak or excessive development of this or that organ; in the general want of balance in the organs, and of harmony of function; in the quality of the blood, and the marked predisposition to certain diseases, like *scrofula* and *consumption*.

A class of diseases called “hereditary” have existed since the days of Hippocrates, and have always been considered difficult to treat, and still

more difficult to cure. Very little attention has been paid to these complaints by sanitarians, as it was supposed they could not be easily prevented. But this is a mistake: they originate from the violation of law by human agency: they can, then, certainly be prevented.

It is admitted by physiologists that all parts of the body can be changed by proper exercise and the law of nutrition,—some parts increased in size and strength more than others,—so that in this way a far greater measure of health can be secured. It is found that decided improvements can be made in the physical system during the lifetime of an individual, and that in three or four generations the human constitution may reach a higher state of perfection. If nature has, therefore, established a physiological standard of health,—which is seldom, if ever, liable to disease,—and at the same time it is well understood this standard is attainable, should not the greatest possible efforts be put forth to secure and maintain this standard? It is here in this field where the germs (the seeds), the primary causes of a vast amount of disease, are to be forestalled. In this warfare with disease we have been content to lop off a few branches, leaving intact the trunk and roots. We have been battling the enemy in the outskirts, without attempting to take the citadel. Here is a great work for sanitary science; here this science is destined to reap its richest harvests. It may take time; but reforms in which the highest welfare of mankind are involved never remain stationary.

SANITATION OF THE FUTURE.

In drawing this discussion to a close, a few suggestions may seem appropriate. While quoting from Dr. Flint's address on "Medicine of the Future," the inquiry arises, Is not sanitary science also to have a "*future*." Most assuredly. Its past history is very brief, and different from that of medicine. This extends back thousands of years, and its whole history is made up of a succession of changes. It is not so with sanitary science. A half-century covers its whole existence. Its only change has been the constant unfolding and applying of Nature's laws to the improvement of health and the prevention of disease. It has not been found necessary in its progress to try experiments or apply any new medicine. As sanitation is based upon the laws of nature, its course cannot change or go backward. *Excelsior* is its motto.

This sanitary movement has certain advantages over other reforms. Its success does not depend upon the medical profession alone, nor upon the patronage of government, nor upon any one body of men, but upon all classes,—men and women. The more people become enlightened on the subject, the more earnestly will they engage in the work, and become at the same time partakers in its benefits.

The history of sanitary science is full of promise for the future. It is really only about twenty-five years since it could be said to have had a fair start. Its doctrines have become deeply rooted, not only in the medical profession, but among large numbers of the laity scattered throughout this country and Europe. The press is committed decidedly

in its favor. Its teachings are found broadcast in books, journals, pamphlets, reports, and newspapers. Its principles are being taught and applied both in our common schools and in higher institutions of learning. Boards of health have been organized in all large cities and in nearly every one of the United States. The benefits already derived from this science cannot be estimated in figures or described in language. The pestilence in this country has been stayed; epidemics have been checked; a vast amount of sickness has been prevented, and a great multitude of lives saved. In Great Britain, where the science has made greater progress and more exact accounts have been kept, upon Mr. Edwin Chadwick's authority, based on the registrar-general's report, it is asserted that the lives of 30,000 persons are annually saved, and 300,000 cases of sickness every year prevented, by means of this science!

The two following statements, though once quoted, are so prophetic that they will bear repeating:

Forty-two years ago Dr. Elisha Bartlett said, in Philadelphia, while urging upon the profession a more thorough knowledge of the causes and nature of disease,—“The next thing to be done is to find out the best method of modifying and *preventing* disease. This is the great mission that lies immediately before us; this is to constitute the great work of the next and succeeding generations.”

Forty years ago Dr. John Forbes, in an address to his brethren, said in London,—“Redoubled attention should be directed to hygiene, public and private, with a view of *preventing* diseases on a large scale, and individually in our sphere of practice. Here the surest and most glorious triumphs of medicine are to be achieved.”

Ten years ago Dr. Henry I. Bowditch, of Boston, who has given more thought to this subject than any other man in this country, said, near the close of his work on “Public Hygiene in America.”—“We stand now at the very dawn of the grandest epoch yet seen in the progress of medicine. While philosophically, accurately, and with the most minute skill, studying by means of physiology, pathological anatomy, chemistry, the microscope, and, above all, by careful clinical observation, the natural history of disease and the effects of remedies, our art at the present day looks still higher, viz., to the *prevention* of as well as to the *cure* of disease.”

These testimonials speak for themselves. They need no comment. The predictions here uttered are certain to be fulfilled. The glorious triumphs spoken of will surely be achieved. Individuals, organizations, and institutions may perish, but these principles will live and advance step by step, from one triumph to another, from one glory to another.

It is related of a distinguished statesman, that, in the immediate prospect of death, he expressed the desire that if possible he might live fifty years more to see certain reforms in government carried out. So, the sanitarian, in forecasting the future, might well wish to live another half century, in order to see the great changes and improvements in society brought about by the principles of sanitary science.

Inter-Relations of Medicine and Sanitation.

A Great Compliment.

The London *Lancet*, recognized as one of the ablest medical journals in the world, devotes its leading editorial in a recent issue to a discussion of Dr. Nathan Allen's paper (which we published by instalments), read last October at an international meeting of sanitarians in Canada. We copy the material portions of this high tribute to our esteemed fellow-citizen. — *Ed. Vox Populi.*

“ In a sense medicine is something different from sanitation, because the cure of disease, popularly at least, appears to be a matter by no means identical with its prevention. This is, however, only so far as appearances are concerned. In truth and fact, the cure of disease is a part of sanitation, and as further progress is made in the science and art of healing it will be demonstrated that the only real cure for disease is the re-establishment of health. Disease is not an entity. It is not a thing apart from the organic life and function of the body affected, but a state or condition, either structural or functional, which is incompatible with the orderly processes of life. And it is in the change of this state or condition, so as to place matters on a footing of health, that ‘cure’ must consist, or amelioration be accomplished. In short, the physician is a minister of health to the sick, by abrogating what is unhealthy and re-establishing health. The old notion of fighting ‘disease’ as an antagonistic force has been superseded, in the progress of science, by one of repairing or readjusting that which is injured or out of order. This change of method in connexion with the treatment of disease has necessitated a reconstruction of the whole system of medicine, and it is on this that the scientific revolution which has been proceeding during the last fifty years has been based. The change is even greater than many of those who have been the subjects of its influence adequately realize. We have, so to say, been carried from north to south, the direction of our progress being almost completely reversed, but so gradually that not only has there been no revulsion of feeling, but we have scarcely been conscious of the change.

One of the most remarkable and yet unappreciated effects of the change of front accomplished has been to convert the army arrayed against disease into a pacific body bent mainly on the prevention of that very war in which our predecessors gloried. To the interests of the population at large the consequent gain has been enormous, but it can not be disguised that upon the profession there has been entailed a loss of both prestige and recompense, which is only just beginning to be realized. The policy of the day—in Physic at least, for Surgery in great part stands on another footing—is one of self-effacement. If only that policy could be thoroughly carried out, the issue would be to abolish disease, and thereby, as it would seem, to put an end to the need of doctors. In proportion as it is possible to give effect to the policy adopted will disease be minimised.

“In an address delivered on the 5th inst., before the American Health Association, by Dr. Nathan Allen, one, and the most prominent, view of this question is discussed.

“It is just to state here that the claims of the sick poor have been most liberally responded to by physicians, and that no other profession or class of men do so much for the poor as the medical profession. But this work of charity has its equivalents;—it secures to the physician a stronger hold in the affection and confidence of the people, and, in different ways, tends to increase his business. But to engage actively in means to prevent disease, not simply in one instance, but in case of great numbers, this is very different,—it cuts off directly the support of the

physician. Such action is based upon a love of humanity—of philanthropy—a higher range of motive than that of giving services to the sick poor. It appeals to the very highest class of motives,—not simply to save expense and relieve suffering, or improve health, and prolong life, but to elevate mankind and increase, physically, mentally, and morally, the sum of human happiness. Such are the legitimate fruits of sanitary science.

“Considering the powerful pecuniary interests of the profession, and the disinterested motives requisite to engage in sanitation work, it is rather surprising that so many members of the profession have, from time to time, engaged heartily in advancing sanitary science. The main object must have been the promotion of health, the diffusion of useful knowledge, and the enlightenment of mankind generally in respect to the laws of health and life. In some few instances, it might have been prompted by pecuniary considerations,—the individual holding some official position, or seeking one. But these are exceptional cases.

“In the main, there can be no ‘ulterior motive’—as the cynical phrase goes—in this policy of general enlightenment and the prevention of disease to, which the medical profession, not only in this but in other countries, has committed itself. It is as though the lawyers should suddenly devote themselves to the propagation of useful knowledge, having for its object the putting an end to all difficulties in the transaction of business, and the general conduct of commercial and social and personal affairs, so as to render every man in a really practical sense his own lawyer.

We are making the public the guardians of their own health, and showing them how to do without that advice, the giving of which constitutes the bulk of our professional business. It is well to look this fact in the face. Why do we act thus suicidally? Is it that we are wholly oblivious to our own interests, or so shortsighted as not to know what we are doing? Neither of these propositions is the true one. It is in virtue of that complete change of front in the treatment of disease, not less than in its prevention, which has come over our scientific policy during the last half-century, and which each year is being strengthened, that this change with the public has been effected. We can not either lay claim to exceptional virtue or confess to more than the ordinary amount of obtusity. There has never been any inscrutable mystery about the treatment of disease. Charlatans have tried to cloak their ignorance with pretense, but the true professors of the healing art have in all ages and countries rather erred on the side of loquacity as to their views and principles of procedure, than hidden or disguised them. Whilst it was believed that disease was something like an entity to combat and struggle against, using drugs and the appliances of art as weapons, this theory found ample expression in the words and utterances of the doctors. Now that it is felt that the re-establishment of health is the true method of procedure, that view is expounded with equal liberality; and as it goes without saying that if what will prevent or correct departures from the line of health-preservation must be better than cure, so by a perfectly natural process, without any exceptional philanthropy or shortsightedness on the part of the medical profession, physic comes to be a matter of sanitation. This we take to be the true explanation of 'The Relation between Sanitary Science and the Medical Profession,' which formed the subject of Dr. Nathan Allen's address at the Health Association.

The point to state plainly and to enforce with emphasis is the fact that the principles of the most advanced method of medical practice are the rectification of function and the obviation of faults and errors in structure in such way as to restore that order of life on which health depends. The nomenclature of disease is regarded more as a means of intercommunication between medical men than as of value in itself. We treat the *patient* rather than the disease, and, in so far as the disease occupies us, it is in its character as a departure from the formula of physiological order rather than as a thing of itself. This is what the profession should bear in mind, and the public ought to understand."

